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ABSTRACT

The concept of general education, its specific goals, and its role in the college curriculum are discussed. The goals of general education appear to center around teaching students to think analytically and to synthesize ideas into a general understanding. It is suggested, however, that these objectives tend to get lost in the specifics of individual courses. Analytical thinking is defined as making accurate identifications, distinctions, or discriminations. Synthesizing ability is associated with integration, generalization, and extrapolation. Responses to short intellectual task tests are examined as a means of assessing students' analytical thinking and synthesizing ability. It is suggested that through analysis of student responses the narrow educational goals of general education can be extended to more general, yet still definable, objectives. The importance of broadening goals beyond the concerns of course content is emphasized. Clarification of the intellectual tasks required of students may lead to new approaches in instruction and should facilitate the skills of analysis and synthesis. (SF)

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Some Specifics in General Education

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Educational Testing Service

One of the problems with general education is its generality. Most college and university faculty members have a general idea about the kinds of learning they want students to acquire beyond the specific knowledge associated with a particular sequence of courses. They are less clear about how to translate those general notions into anything that can be taught explicitly. In contrast, course content is usually clearly enough defined to direct the structure and activities of the course. It also guides the evaluation of achievement with respect to the course's objectives. If the learning expected to occur in programs of general education is to be realized, it will have to be defined specifically enough to give instructors something to teach and students something to learn.

The problem is illustrated by engineering faculty members who say their general objective is to teach their students to think like engineers but who then have trouble describing how engineers think that is different from the way historians or anthropologists or economists think. Understanding concepts and applying them in the solution of problems are the heart of most engineering courses, but whether engineering students in fact become more proficient in those general abilities in ways that can then be transferred to courses in other fields or to situations outside a classroom is not known. Probably they do, but I would be more confident of that if I thought engineering faculty members gave explicit attention to that in their teaching.

Typical engineers are thought to be logical,

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analytic, objective, orderly, and even linear in their thinking, and engineers do indeed have predilections toward styles of thinking that are consistent with that stereotype. But freshman composition courses often are intended to teach logical, analytic thinking, and I doubt that their instructors would state one of their goals to be teaching students to think like engineers. The general objectives of courses, whether in engineering or English and whether intended for specialists or generalists, tend to get lost in the specifics of the course. "General" is one of those interesting words that is what it means. It's a general word with lots of meanings, some not very precise. One meaning is "applying to the whole; not limited to one branch or department of learning." This is the meaning intended by general education. But an alternative meaning is "vague, not precise; lacking in details; not specific." This is often also pertinent to general education. It need not be so.

Two of the commonly stated objectives of general education that can help reduce its generality in the sense of vagueness are learning to think analytically and to synthesize ideas into a more general understanding. Analytic thinking may loosely be thought of as taking ideas apart for closer examination. Synthesizing is putting ideas together into larger or more inclusive concepts. I'm intrigued by the heavy emphasis on analysis in Harvard's new core curriculum and the absence of synthesis. This seems to be a common imbalance in higher education even though synthesis is given high importance in statements of educational goals. If these two widely accepted objectives can be defined clearly enough to suggest how they might be taught, general education will have made a substantial advance.

Faculty members have defined analytic thinking partly in terms of making accurate identifications, distinctions, or discriminations. Synthe-

sizing ability is associated with integration, generalization, and extrapolation. The more extensive definitions in Figure 1 guided the design of short intellectual tasks to be given students as a means of assessing performance in analytic and synthesizing ability. Observing the ways students respond to the tasks, as well as how well they have learned or how proficient they have become, can lead to clearer definitions of the two abilities and to better discrimination between them.

The task in Figure 2 asks students to identify at least one critical assumption underlying a set of assertions about the relative industrial productivity of the U. S. and Russia. This is a task involving discrimination as well as identification, two aspects of analytic thinking. Responses are not graded in the usual sense but are placed in one of six categories, three of which are described below the question.

The two types of response that are not entirely adequate often characterize responses to synthesizing as well as analytic tasks. About one student in five introduces additional information gratuitously, failing to stay within the defined task. Others merely restate the given information, failing to engage the task intellectually. Both these classes of response represent failures of discrimination, one a failure of inclusion and the other of exclusion. The most common responses, in two categories not described in the figure, are partial responses that are acceptable as far as they go but are not complete.

A characteristic question assessing synthesizing ability is shown in Figure 3 with four of its five response categories. The task is fairly straightforward, presenting students with a list of specific pieces of information and asking them to form two generalities from the given information. It's one of the easier questions; more than a third of the students

give a completely acceptable response. About 20 per cent do not relate their responses to the given information. Another 20 percent, rather than combining elements into a general statement, select one or two issues and comment about them. They confuse generalization with elaboration. Another group of about 10 per cent simply enumerate the points given them in the question, restating rather than generalizing.

This type of response--giving back what is given without anything having been done to it, and found in responses to analysis as well as synthesizing tasks--is one reason discrimination between the two abilities is sometimes difficult. What we need is enough responses by the same students to several questions in both analysis and synthesis to learn what connection exists, if any, between the task set for the student and the nature of the less-than-adequate responses. Do students, for example, fail to come to grips with some intellectual tasks more frequently than with others? Is overgeneralization in synthesizing associated with the gratuitous introduction of additional material in analysis? While analysis and synthesis are discriminable processes in their abstract definitions, are they in practice distinguishable? Does ability in one imply ability in the other? Is analytic ability prerequisite to synthesizing ability?

I don't have answers to these questions, but their formulation as a result of the information provided by responses to the intellectual tasks just discussed is a step toward particularizing general education. Instruction in distinguishing between overcautious, acceptable, and unsupported inferences, for example, may produce general improvement in both analysis and synthesizing. It is a form of instruction that does not occur in higher education to any appreciable extent, yet one that may lead to a widely accepted goal of general education.

Attention to student learning in various aspects of analytic and synthesizing ability can help faculty members move beyond knowledge of content as a limited educational goal to more general yet still definable objectives. Other efforts to broaden education beyond a concern for content alone have focused on characteristics of students--aptitude, interests, personality, or cognitive style--that is, on human development rather than acquisition of knowledge. Yet general education is not adequately defined by the acquisition of knowledge or human development or both combined. The concern for intellectual processes suggested by analytic and synthesizing ability seems a more appropriate addition to the content of general education than does human development.

The kind of questions I've described, as well as sharpening the conceptualization of general education, can also help faculty members more directly. Reviewing the questions before asking students to respond to them helps faculty members define their own expectations for student learning. Then seeing the kinds of responses students make can lead to redefinition of expectations, not necessarily in terms of raising or lowering them but in terms of the nature of the intellectual tasks with which students are to be engaged. Redefinition or clarification of the intellectual tasks to be put before students can lead to reformulation of the questions, new approaches to instruction, new observations of student performance, and so on in a spiraling sequence.

General education, as I've been describing it here, can occur in any part of the curriculum--in core courses, in distribution requirements, and in departmental offerings. What is required is that the purposes of general education be specified and made the object of instruction in whatever kind of courses are made the vehicle for that instruction. Improvement

of general education requires that kind of specificity. Generality need not imply vagueness.

Analytic Skill

High: Students high in analytic skill are quick to identify the essential components of ideas, events, problems, and processes. They distinguish the important from the unimportant, fact from conjecture, and make other distinctions imaginatively but usefully. They pick out quickly deficiencies or inconsistencies in statements or positions. They are realistically skeptical or critical but not destructively so.

Middle: Middle-level students find the essence of a problem or set of ideas through methodical effort rather than quick perception. They make useful distinctions among objects or ideas but not those that are unusual or imaginative. They find the obvious deficiencies in ideas or situations they are presented and effectively follow standard or accepted procedures to identify and solve problems. They are appropriately skeptical or critical but may miss a subtle inconsistency or fail to see an unusual but available resolution of an apparent problem.

Low: Students low in analytic skill have difficulty getting beneath the surface of a problem, idea, or a situation. They work with what they are presented, rarely dissecting it to examine the source or nature of a problem. They have difficulty distinguishing the essential from the unessential or making other discriminations that would simplify their task or lead to more effective solutions to a problem. They tend to be either uncritical, accepting what they are presented without question, or blindly critical, raising questions or objections that are neither well-founded nor useful.

Synthesizing Skill

High: Students with a high degree of synthesizing skill are adept at organizing apparently unrelated ideas into a common frame of reference. They find unifying themes or common threads that let them deal effectively with diffuse bodies of information. Facility at constructing a general framework to accommodate whatever information they have lets them move easily beyond that information, applying its principles in new situations, generalizing usefully to other bodies of information, or extrapolating from given to unknown situations. In short, they synthesize what they know into more general intellectual structures that they can bring to bear on new problems.

Middle: Students at an average level of synthesizing make connections between ideas when they are apparent or have been pointed out. Having seen the connections, they can then apply them and may also make similar connections with similar ideas. They are not likely spontaneously to form connections among ideas or to make useful generalizations much beyond the given material. They grasp most of the material presented them either in the classroom or textbooks but may have difficulty with highly complex and abstract systems of concepts.

Low: The students low in this skill have difficulty relating ideas into higher order abstractions. They may grasp what is presented to them at the moment but do not readily integrate the current ideas with what has gone before or appreciate their ramifications into other situations. Their generalizations are often faulty, appearing to result from a quick focus on one or two salient points rather than from more complete understanding.

Figure 1. Definitions of analytic and synthesizing abilities.

COMPARISON BETWEEN THE U.S. AND RUSSIA

"In our climate of freedom in which we live, we (the United States) outproduce every other country in the world. Take Soviet Russia, for instance: in size, Russia is twice as large as the United States. In population, Russia has one-fifth more people than the United States. Russia has an abundance of natural resources. But in the actual production of goods and services--and this includes both capital goods and consumer goods--we in this country, in our climate of freedom, outproduce Soviet Russia more than two to one."

Norris M. Sanders, Classroom Questions: What Kinds? (New York: Harper and Row, 1966).

State two or three assumptions underlying the reasoning in the above quotation. Then put a check by the one most crucial to the meaning of the paragraph and explain why that one is crucial.

Selected Response Categories

1. Any one of several acceptable assumptions is stated and the reasons for its being crucial are clearly explained. (18%)

2. An assumption is stated that cannot be inferred from the quotation (e.g., Americans are greedy; Russia doesn't have freedom because it's Communist). (18%)

3. The response only restates given information. (7%)

Figure 2. Sample analysis task with selected response categories. (Percentages are from a heterogeneous group of about 150 students in 15 colleges and universities.)

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STRENGTHS AND WEAKNESSES OF GOVERNMENT

The following features of the major institutions of the American national government, taken together, point to both an obvious strength and an increasingly recognized weakness of our system of government:

Bicameral legislature
Committee system
Seniority system
Presidential veto
Dual system of courts (federal and state)
Courts of primary jurisdiction and appeals courts
Nine Supreme Court justices
New laws can circumvent court decisions
Presidents can appoint a new crop of judges
Congressional power to override a veto
Court restriction of executive privilege
Proliferation of the presidential staff
Independent regulatory commissions, government corporations and other independent agencies
Presidential power of appointment of agency heads
Congressional power of appropriation of funds

Without analyzing each item above, describe both the strength and the weakness of the federal government that the list suggests.

Selected Response Categories

1. The response describes the value of checks and balances and the problems of divided responsibility and authority that accompany them. (38%)

2. The response makes a valid statement about the federal government, but it is not related to the given statements. (22%)

3. One or two given statements are expanded without integrating other statements into the response. (18%)

4. The response enumerates several of the given points with neither integration nor elaboration. (11%)

Figure 3. Sample synthesizing task with selected response categories. (Percentages are from a heterogeneous group of about 150 students in 15 colleges and universities.)

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